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AN ASPECT OF THE ECONOMIC IMPACTS OF DEFENSE AND SPACE CONTRACTS IN THE PHILADELPHIA METROPOLITAN AREA *

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ABSTRACT

Since the end of World War II annual expenditures for national security have increased at a substantial rate so that a large proportion of the American economy is presently devoted to the defense effort. Recent developments, however, have indicated a relaxation of international tensions with some form of disarmament becoming a more realistic goal. Although economists have noted that a disarmament program might not seriously affect the national economy, it is quite clear that even a slight cutback in defense expenditures would create serious economic problems in certain regions of the United States where a large share of the local economy is devoted to military sales. Since Philadelphia has maintained a large volume of defense sales, the question of economic impacts of a decline in the level of these sales becomes vital. An industrial survey was undertaken to reveal those industries selling products to the Department of Defense and the National Aeronautics and Space Administration. The results of this survey suggest the nature and characterisitics of the defense-space relations in Philadelphia.

(TEXT)

While efforts to reduce the high level of defense expenditures in the United States have stressed the desirability of a positive approach to the relaxation of

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international tensions and the need for solutions to pressing social problems, communities experiencing cutbacks in defense appropriations have aroused political wrath at all levels of government. The immediate importance of this dilemma has prompted an investigation of its economic characteristics.

During World War II annual expenditures for national security averaged $60 to $80 billion or about 35 percent of the Gross National Product of the United States. After a considerable decline at the end of the war, expenditures again rose to $50 billion during the Korean Crisis, representing almost 14 percent of GNP. Expenditures for National Security did not appreciably fall after 1953, but have maintained an annual level of greater than $40 billion, or about 10 percent of GNP. [1]

Discussions of disarmament have frequently focused on the economic problems which might be engendered by a drop in the level of defense appropriations. Defense cutbacks are seen as likely to induce an economic crisis; certainly complete or total disarmament would produce this national economic emergency. Rebuttals to this argument have noted that any disarmament program would be gradual, extended over a long period and combined with offset programs to significantly cushion the impacts of the arms reduction. Suits summarizes this point:

> ... As would be expected, absolute figures are large. In fact, it is evident that an abrupt, politically irresponsible termination of the defense program would unquestionably precipitate a serious economic crisis. But a program of general and complete disarmament ... scheduled over a twelve-year period, combined with only the most elementary offsets in the form of tax reduction and transfer expenditure creates an adjustment problem of a lower order of magnitude than that posed year in and year out by the growth of the labor force and increasing productivity. In fact, the impact of disarmament represents a slight --- almost unnoticeable --- intensifications of the problem of adjustment to economic growth in general. [2]

While the national economy would appear to be capable of successfully adjusting to the arms reduction, on a smaller scale, regions and certain communities would indeed be faced with crippling economic problems. The success and expediency of offset programs at this level can, at best, be doubtful. In addition certain industries would encounter similar, critical problems. It is a well

recognized fact that the defense industry is characterised by extreme concentration in a few regions, in a few industries, and in a few companies.

The economic question of the effects of a reduction in military spending can be posed as the dependence of a region's economy upon the Department of Defense, or, similarly, the importance of the defense industry in a regional economy. The direction of research can now be expressed as first measuring, for a region, the importance or extent of the defense relationship, then secondly, evaluating the possible effects or economic impacts of any defense cutback.

Recent research at the University of Pennsylvania has produced several monographs which report the distribution of prime contracts to industry by the Department of Defense.. These have provided extensive detail for states, metropolitan areas, and counties arranged by industrial category for fiscal years 1960, 1962, and 1964. [3]

This research also made a preliminary attempt at impact analysis by employing certain techniques which analyzed the industrial structure of several metropolitan areas and which estimated the economic effects of a military cutback. [4] This analysis used the input-output or interindustry approach. That is, each sector of the local economy is viewed as interrelated to all other sectors so that a prime award by the Department of Defense to one industry is seen as affecting another industry which supplies raw materials to the prime contractor. This subcontractor is then connected to other industries from which it purchases raw materials and supplies. Other industries become involved in a similar manner, and the total economy is affected as the wages from all industries purchase local goods and services.

This impact analysis not only revealed the repercussions of defense cutbacks, but in an identical manner, showed the economic effects of some policies which government might sponser to compensate or offset the defense cutback. Although this analysis can only be considered as preliminary and the resluts as tenuous, the excercise nicely illustrated the importance of the defense industries in several metropolitan areas. [5] The techniques are currently being improved to

better treat this problem.

One deficiency in this published research is its failure to completely define the defense relationships of any region. While it does list the values of defense sales by industry, it does not indicate the nature or degree of this dependence. That is, a cutback of defense expenditures to one firm which does only 10 percent of its business with the Department of Defense would have a completely different impact upon the economy of a region than the same cutback in another firm which devotes 100 percent of its effort to military sales. While it is important to know the total sales by industry to the Department of Defense, it is also important to be aware of the individual, industrial dependence.

An attempt has been made to assess this critical role of individual firms, and collectively, industries. A survey of manufacturers in the Philadelphia metropolitan Statistical Area asked firms the proportion of their total production sold to the Department of Defense and the National Aeronautics and Space Administration. The inclusion of NASA in the survey was important because of the close similarity of the producers of both military and space products. Information was requested for Fiscal Year 1960.

Among other questions concerning characteristics of each firm, the survey also asked each firm to estimate its sales to the defense-space program as both prime and subcontractor. Some difficulty was encountered as manufacturers expressed uncertainty in the destination or consumption of the final product, that is, many firms had no knowledge of the defense-space role of its customers.

While the sample design was almost a complete census of all Philadelphia manufacturing firms employing greater than 100 people, only 970 firms responded with adequate information. The reliability of the sample in terms of coverage of all Philadelphia manufacturing firms is shown in Table 1. This table lists estimates for the total number of firms and total employees in Philadelphia manufacturing in 1960, and also lists the respective number of firms which responded to the request for information. The percent of employment covered by the firms in the sample is shown in Column 5.

TABLE 1

FIRMS AND EMPLOYEES IN PHILADELPHIA MANUFACTURING INDUSTRIES

TOTAL AND SURVEY SAMPLE

1960

SIC Code	Industry Title	Estimated Total Philadelphia SMSA		Philadelphia Survey		
		Number of Firms (1)	Number of Employees (2)	Number of Firms (3)	Number of Employees (4)	Percent Coverage (4) ÷ (2)
19	Ordnance	10	1141	2	160	14.0
20	Food and Kindred Products	597	47814	45	11820	24.8
21	Tobacco Manufacturers	19	2981	2	8	0
22	Textile Mill Products	417	32096	93	10356	32.2
23	Apparel and Related Products	756	55058	108	16667	30.2
24	Lumber and Wood Products	148	2423	13	666	27.5
25	Furniture and Fixtures	239	7267	35	1868	25.6
26	Paper and Allied Products	216	21345	31	6053	28.4
27	Printing and Publishing	933	37437	54	7444	19.9
28	Chemicals and Allied Products	351	30544	54	13326	43.6
29	Petroleum Refining and Related Products.	38	13041	12	4647	35.6
30	Rubber and Misc. Plastics Products	140	12203	17	3366	27.6
31	Leather Products	80	5016	23	2114	42.1
32	Stone, Clay and Glass Products	252	14178	56	6640	46.8
33	Primary Metal Industries	165	34241	40	7174	21.0
34	Fabricated Metal Products	769	38065	106	14993	39.4
35	Machinery, Except Electrical	721	45241	117	22506	49.7
36	Electrical Machinery	280	39610	48	24707	62.3
37	Transportation Equipment	81	38738	17	11658	30.1
38	Instruments and Related Products	135	11462	30	7609	66.4
39	Miscellaneous Manufacturing Industries	264	7786	67	2838	36.4
TOTAL		6601	496546	970	176620	35.5

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The results of the survey are shown in Table 2. The first three columns in the talbe list again the pertinent coverage of the responses to the industrial survey, that is, 970 firms reported data with a total of 177,000 employees and sales of $3.8 billion. These responses revealed that 332 firms or 34 percent of the reporting firms had military and space sales. For these 332 firms, 37,600 of their employees owed their jobs to $635 million of sales to the Department of Defense and NASA. The electrical machinery industry (SIC 36) is seen as the largest defense-space industry in Philadelphia with sales of $303 million and 18,000 employees. Another industry showing strong dependence upon the military and space program is the transportation industry (SIC 37) with 7,500 employees and $140 million of defense-space sales. Table 2 also notes the relative importance of this military and space relationship by showing the percent which these sales assume of the total sales of the responding firms. The electrical machinery firms reported that 62.4 percent of their total sales were defense-space, and the transportation industry reported 58.5 percent. Other important industries are shown in Table 2 as the fabricated metal products industry (SIC 34), the primary metal products industry (SIC 33), the machinery except electrical industry (SIC 35), and the instruments industry (SIC 38). It should be observed that all industrial categories reported defense-space sales, except the tobacco (SIC 21) and the wood products industries (SIC 24). It should be noted that the information in Table 2 underestimated the true role of Philadelphia manufactureres in the military and space programs since many subcontractors were uncertain of their role in the program.

Table 3 clarifies the position of Philadelphia manufacturing by listing pertinent data for those firms reporting more than 10 percent of their sales to the military and space agencies. This table shows that only 15 percent or 143 firms showed this somewhat greater dependence upon the defense-space program. In addition, Table 3 shows that the total value of dependency is relatively stable; these 143 firms still account for a large proportion of the total defense-space

TABLE 2

DEFENSE-SPACE SALES OF PHILADELPHIA

MANUFACTURING INDUSTRIES, SURVEY SAMPLE, 1960

SIC Code	Total Survey: Number of Firms	Total Survey: Number of Employees	Total Survey: Sales $000	All Firms Involved in the Defense-Space Program: Number of Firms	Defense-Space Employees	Defense-Space Sales $000	Defense-Space Sales as a percent of Total Industry Sales (Survey)
19	2	160	4050	2	60	1453	35.9
20	45	11820	438620	11	42	1340	0.0
21	2	8	48				0.0
22	93	10356	173830	15	102	2448	1.4
23	108	16667	184853	18	357	4002	2.2
24	13	666	23537				0.0
25	35	1868	33747	8	76	1659	4.9
26	31	6053	120024	8	111	2308	1.9
27	54	7444	106864	11	246	3960	3.7
28	54	13326	518066	16	607	20638	4.0
29	12	4647	309799	7	127	7340	2.4
30	17	3366	99810	6	130	1536	1.5
31	23	2114	33265	1	1	6	0.0
32	56	6640	203631	17	374	5103	2.5
33	40	7174	149489	24	1267	23385	15.6
34	106	14993	270647	47	3790	63026	23.3
35	117	22506	293220	67	3345	38647	13.2
36	48	24707	485649	31	18126	302902	62.4
37	17	11658	239581	10	7464	140076	58.5
38	30	7609	97273	16	1126	12427	12.8
39	67	2838	43369	17	248	2684	6.2
TOTAL	970	176620	3829372	332	37599	634939	
Percent of Total Survey				34.2%	21.3%		16.6%

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TABLE 3

CRITICAL DEFENSE-SPACE SALES OF PHILADELPHIA

MANUFACTURING INDUSTRIES, SURVEY SAMPLE, 1960

SIC Code	Firms with Greater than 10 Percent of Sales to the Defense-Space Program				Firms with Greater than 50 Percent of Sales to the Defense-Space Program			
	Number of Firms	Firms Total Employees	Defense-Space Employees	Defense-Space Sales $000	Number of Firms	Firms Total Employees	Defense-Space Employees	Defense-Space Sales $000
19	2	160	60	1453	1	17	17	343
20	1	32	8	265				
21								
22	2	200	50	600				
23	6	712	324	3629	1	212	170	1340
24								
25	2	91	58	1373				
26	2	590	83	1875				
27	3	414	231	3739	1	200	130	1625
28	4	3848	504	16297	1	86	79	1143
29	1	10	5	300				
30	2	136	112	1284	1	89	89	784
31								
32	4	449	292	3545	3	300	265	3182
33	15	3358	1192	21517	5	829	719	12159
34	22	4767	3614	60214	5	3581	3317	55467
35	31	9567	3099	34693	10	1927	1894	17953
36	23	21588	18093	301918	16	19605	17413	291345
37	9	10857	7461	139923	7	6757	6622	123883
38	8	2283	983	10669	3	532	414	3525
39	6	641	242	2616	1	190	109	1294
TOTAL	143	59703	36411	605910	55	33213	31212	514043
Percent of Total Survey	14.8%		20.6%	15.8%	5.7%		17.7%	13.4%

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production in Philadelphia.

While the 10 percent level of dependency has no apparent validity as a critical measure of the defense-space tie, a criterion of 50 percent suggests greater pertinence. Firms with less than 10 percent of their sales to the defense and space agencies are not likely to encounter serious economic problems with the cancellation of their contracts. Table 3 shows the comparable listing for those firms reporting greater than 50 percent of their sales to the Department of Defense and NASA. It is now significant to note that only 55 firms or 6 percent of those responding to the survey fit this criterion. More important, the total level of defense sales still remains relatively constant. The point to be emphasized is that only a small number of firms are critically dependent upon the defense-space program. Further investigation of these 35 firms offers support as follows:

(a) six firms alone account for $475 million of local defense-space sales which can be translated into 27,000 defense-space jobs;

(b) 22 of the 55 firms in this critical category employ less than 100 employees and 46 of the 55 firms employ less than 300 people;

(c) 50 of the 55 firms send greater than 70 percent of their sales to to the defense and space agencies, and 35 of the 55 firms send greater than 90 percent of their sales.

In conclusion, the survey results indicate that the bulk of the defense manufacturing in the Philadelphia Metropolitan Area is concentrated in only a few of the very large firms. The economic effects of disarmament in this region would critically be centered in only a very small sector of the economy with most of the manufacturing firms being only slightly affected. The total impacts or effects of disarmament in Philadelphia must now be measured and evaluated through an intensive study of the interindustry or input-output relations with specific attention given to the interrelations of these largest defense-space manufacturers.

FOOTNOTES;

[1] Merton J. Peck and Frederic M. Scherer, The Weapons Acquisition Process: An Economic Analysis (Boston: Harvard Business School, Division of Research, 1962) p. 100.

[2] Emile Benoit and Kenneth E. Boulding, eds., Disarmament and the Economy. (New York: Harper and Row, 1963) p. 111.

[3] Walter Isard and James Ganschow. Award of Prime Military Contracts by County, State, and Metropolitan Area of the United States, Fiscal Year 1960. (Philadelphia: Regional Science Research Institute).

Walter Isard and Gerald J. Karaska. Unclassified Defense Contracts: Awards by County, State and Metropolitan Area of the United States, Fiscal Year 1962. (Philadelphia: World Friends Research Center, Inc., December 1962).

Walter Isard and Gerald J. Karaska. Unclassified Defense and Space Contracts: Awards by County, State, and Metropolitan Area, United States, Fiscal Year 1964. (Philadelphia: World Friends Research Center, Inc., March 1965)

[4] Walter Isard and Eugene W. Schooler, "An Economic Analysis of Local and Regional Impacts of Reductions of Military Expenditures," Papers, Peace Research Society (International), Vol. I, 1964, pp. 15-44.

[5] For an excellent critique of this analysis see: Emile Benoit, "Comments on Isard and Schooler and on North, Brody and Holsti", Papers, Peace Research Society (International), Vol. 1, 1964, pp. 49-56.